V. Operations and Infrastructure Strategic Plan

The Laboratory's fourth strategic objective is stated in Chapter II: "The University of Chicago and Argonne will continuously improve the cost-effectiveness, management, and operations of the Laboratory." This chapter presents strategic plans for the following areas of operations and infrastructure at Argonne: human capital; environment, safety, and health; site and facilities; integrated safeguards and security management; information management; communications, outreach, and community relations; performance management; and cost-effectiveness of support functions. The chapter begins with general statements of mission, situation, and goals and strategies for operations and infrastructure.

General Mission

Operations infrastructure and support activities are crucial to the achievement of Argonne's R&D missions. Operations organizations work as partners with the Laboratory's R&D programs, providing cost-effective, customer-focused infrastructure and services that enable the creation of world-class science, technology, and service products. Maintaining this institutional environment and support structure requires effective, efficient accomplishment of the following major mission elements:

- Provide administrative, business, and technical support to the Laboratory's science and technology programs.
- Ensure the recruitment, development, and support of top-caliber, diverse human capital.
- Facilitate and support safety and health in the workplace.
- Provide environmental stewardship of the Laboratory's sites.
- Manage and operate the Laboratory's physical plant; upgrade general plant facilities or construct new facilities as required. Provide a safe, secure work site that protects the Laboratory's people, facilities, physical property, and intellectual property.

General Situation Analysis

Because operations and infrastructure are funded as a charge to the total program funding received by the Laboratory, there is always great incentive to reduce these overhead costs while still maintaining the effectiveness and quality of operations and services. Every overhead dollar saved is an additional dollar for direct funding of research programs.

The terrorist attacks of September 11, 2001, have had a profound effect on the DOE laboratory system. One of the most evident responses has been increased security at laboratory sites. Argonne achieved enhanced security with minimal disruption of its ability to carry out its R&D missions. In general, Argonne has conducted its efforts in security, counterintelligence, and cyber protection in an integrated and highly coordinated fashion. This integrated management of safeguards and security is similar to the Laboratory's earlier establishment of integrated safety management.

General Goals and Strategies

The goal of Argonne's operations infrastructure and support functions is to conduct all work and operate facilities cost-effectively and with distinction so as to achieve integration with and support of its missions in science, technology, energy, and environmental quality, while fully protecting its workers, users of its facilities, the public, and the environment. The Laboratory continually strives to increase the efficiency of its operations and support units while maintaining their effectiveness and quality. The performance-based contract between the University of Chicago and DOE, hereafter referred to as the *Prime Contract*, provides a system for encouraging continuous improvement in Argonne's operational

functions (as discussed further in Section V.G). With collaboration and support from DOE's Chicago Operations and Argonne Area Offices, the Laboratory continues to refine a full range of best business practices.

A. Human Capital

Situation

The quality of technical staff is a primary determinant of the performance of an R&D laboratory. Argonne's human resources strategy is designed to develop strong leadership, to support a creative and diverse workforce, and to recruit and develop the talent needed to implement the Laboratory's programmatic activities and initiatives.

Human resources management at Argonne is conducted as a partnership between the Laboratory's programmatic and operations organizations and the central Human Resources Division. Critical to the success of this effort is a focus on Laboratory policies, programs, and initiatives that influence an individual's decision to join the Laboratory, that help shape the working environment for those making a career at Argonne, that contribute to the well-being of employees — even after they retire — through important benefits such as health insurance and retirement income, and that comply with federal and state regulations.

Total commitment to equal opportunity for all people is a fundamental Laboratory policy. Argonne values the diverse cultural and ethnic backgrounds of its employees and strives to create an environment that capitalizes on these differences as one means of maintaining a high-performance workforce.

Goals

The goal of Argonne's human capital management is to support the strategic objectives of the Laboratory's programmatic and operations organizations by developing and implementing programs that attract, develop, compensate, and help retain a qualified and diverse staff. Specific objectives include the following:

- Directly link and integrate centralized human resources strategies with the strategic needs of division managers.
- Improve the quality of work life to foster a work environment that promotes staff satisfaction, individual contribution, and organizational effectiveness.
- Maintain a compensation policy that is competitive with policies at peer organizations and that rewards superior performance.
- Promote the commitment of managers at all levels to equal opportunity, affirmative action, and diversity.
- Develop Laboratory leadership and staff capabilities through targeted management training and skill development opportunities.
- Provide services that promote the well-being and productivity of Argonne employees.

Strategies

The key to effectively integrating centralized human resources strategies with the needs of individual programmatic and operations divisions is frequent dialogue with division managers, particularly regarding opportunities for centralized services beyond purely administrative functions. To enhance communication and achieve this integration, the Laboratory uses formal management surveys, input from human resources liaisons within the divisions, and direct dialogue with division managers. During regularly scheduled one-on-one meetings, division directors and human resources representatives discuss personnel and recruitment needs, training, diversity targets, and the division's general human capital needs.

Achievement of Laboratory goals requires top-quality staff who find personal and professional fulfillment in their work (Table V.1). Argonne's success in recruiting and developing high-caliber employees starts with recruiting the best and the brightest, including people from diverse backgrounds. In FY 2001 Argonne recruiters participated in 16 job fairs, through which they directly contacted over 900 potential new hires.

Table V.1 Academic Degrees of Argonne Staff[a]

Occupational Category	Total	PhD	MS/MA	BS/BA	Other[b]
Officials and Managers	513	222	129	96	66
Scientists	638	328	127	126	57
Engineers	618	220	159	150	89
Managers and Administrators	258	23	54	100	81
Technicians	552	1	6	70	475
All Others	1,000	0	2	60	938
Grand Total	3,579	794	477	602	1,706

[a]Number of full- and part-time regular employees as of September 30, 2001.

[b]Associate level degree or less.

Argonne is committed to strengthening the vitality, quality, and diversity of its workforce. Maintenance of a competitive compensation structure is important in the Laboratory's competition for critical talent. Argonne manages all components of compensation — base pay, merit increases, compensation supplements, and promotion-related increases — as a coordinated whole. Each employee's compensation (apart from fringe benefits) is linked to achieved performance, as evaluated under the Laboratory's appraisal process. That process focuses on sustained performance and compensation relative to peers and the external market. In early FY 2002, after an in-depth analysis, DOE certified Argonne's compensation system and characterized it as one "that demonstrates continuous improvement, creativity, and effectiveness."

Total commitment to equal opportunity for all individuals is a fundamental Laboratory policy (Table V.2). The Laboratory's annual *Affirmative Action Plan* gives Argonne managers a summary of previous accomplishments and a blueprint for the future. The importance of increasing the low percentage of women and underrepresented minorities in scientific, engineering, and upper management is fully appreciated. However, this process is slow when constant-dollar Laboratory budgets are flat or declining. In general, supervisors are held accountable for progress in this area. In FY 2001, job postings and recruitment ads were placed in eight magazines

Table V.2 Equal Employment Opportunity at Argonne[a]

Occupational Category	Total		Minority Total		White	
	Male	Female	Male	Female	Male	Female
Officials and Managers	414	99	33	9	381	90
Scientists and Engineers	1,085	171	161	30	924	141
Managers and Administrators	112	146	7	22	105	124
Technicians	486	66	45	10	441	56
Clerical Workers	18	434	3	67	15	367
Craftsmen and Laborers	341	37	64	15	277	22
Service Workers	124	46	28	13	96	33
Totals	2,580	999	341	166	2,239	833

Occupational Category	African-American		Hispanic		Native American		Asian	
	Male	Female	Male	Female	Male	Female	Male	Female
Officials and Managers	5	4	4	1	1	0	23	4
Scientists and Engineers	17	2	14	4	2	0	128	24
Managers and Administrators	2	9	3	5	0	1	2	7
Technicians	17	3	17	1	2	1	9	5
Clerical Workers	2	31	1	25	0	2	0	9
Craftsmen and Laborers	47	12	13	2	1	1	3	0
Service Workers	18	6	4	6	2	1	4	0
Totals	108	67	56	44	8	6	169	49

[a]Includes both full-time and part-time regular employees as of September 30, 2001.

and web sites that target minority job candidates, an increase from six in FY 2000.

Argonne supplements the formal education of its employees with performance-enhancing training. Course offerings are based both on assessment of professional development needs and on compliance with DOE directives. The Laboratory offers courses on a wide range of subjects, including supervisory skills, team building, project management, presentation skills, and R&D proposal development. It recently introduced the *Management Minute*, a quarterly online newsletter designed to improve the leadership skills of Laboratory managers and supervisors. In addition, to provide just-in-time training for supervisors and employees, the Laboratory is piloting *The OnLine Learning Center*, a web-based training library offering over 900 courses.

Additional Argonne programs that promote the well-being and productivity of employees include health screening and wellness programs, financial education programs, and programs for dealing with life and family issues. Examples include seminars on financial topics such as funding education, individual retirement accounts, and tax strategies; a seven-part lecture series on complementary and alternative medicine; an elder care fair; and a health fair.

To increase the effectiveness and quality of human resources information and to reduce costs, Argonne is taking advantage of new electronic approaches to information management and reducing its dependence on traditional paper documents. For example, a new online open enrollment system was introduced as the first phase of a larger employee self-service capability. The new system allows employees to view current benefits, research available benefit options, and make changes to health care plans or flexible spending accounts. In another example, the Laboratory's online systems for administering merit review and position descriptions allow programmatic divisions to manage staffing and compensation planning more effectively and efficiently. In addition, the Laboratory's intranet now provides electronic versions of the employee handbook, policy and procedures manuals, and benefit plan descriptions, along with information on the historical performance of retirement funds.

B. Environment, Safety, and Health

Situation

Protection of the environment, safety, and health (ES&H) is a fundamental value for Argonne. Safety statistics confirm that Argonne is a safe place to work, and both analysis and experience indicate that Laboratory operations have minimal environmental impact. For example, as Figure V.1 shows, for the past several years the Laboratory has maintained case rates for recordable and lost/restricted workdays — as defined by the Occupational Safety and Health Administration — that are low relative to comparable industry rates. Argonne's FY 2001 *Self Assessment* explains Argonne's progress in ES&H in detail (URL: www.ipd.anl.gov/cpmr/text.html).

Argonne recognizes the need for continuous evaluation and improvement in its ES&H programs, and it has firmly embraced its integrated safety management (ISM) policy as an operating philosophy. ISM maintains employee attention to essential ES&H issues, goals, and ideas. The structure of the ES&H program is described in depth in the *Integrated Safety Management (ISM) Program Description, Revision 6*, dated February 25, 2002 (URL: http://www.anl.gov/ESH/main/ism/pdf/ISM-rev6.pdf).

Argonne's ISM program includes investigation of incidents and proactive management of Worker's Compensation claims through

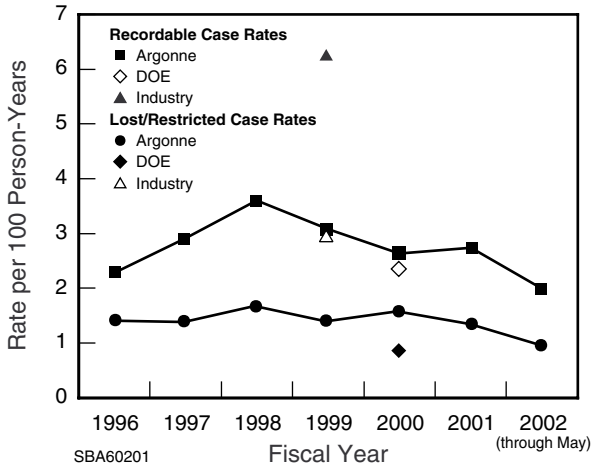

Figure V.1 Case Rates for Recordable and Lost or Restricted Workdays

coordination of medical department interventions and ES&H analyses with investigations of causes by line managers. The central goal is to protect employees from occupationally related injury or illness.

During FY 2002, the Laboratory's medical department will continue to support DOE's Beryllium Worker Protection Program and will offer beryllium blood lymphocyte testing to voluntarily participating employees. In cooperation with DOE, the Laboratory is assisting the Oak Ridge Institute for Science and Education (ORISE) in offering former employees an opportunity to participate in ORISE's Beryllium Medical Surveillance Program. Argonne strongly supports both of these beryllium-related programs.

Goals and Objectives

The overall goal of Argonne's ES&H program is to ensure that all activities are conducted (1) with minimal and measured adverse impacts to personnel and the environment and (2) within regulatory constraints. The central tenet of ISM throughout Argonne is line management responsibility and accountability, in conjunction with the expectation that each worker is involved in ISM and accepts responsibility for implementing and promoting it.

To strive for continuous improvement in achieving this overall goal, Argonne has established five specific strategic objectives:

- Conduct an ES&H program that effectively supports R&D activities and is judged to be "outstanding" by both DOE and peer laboratories.
- Promote assessment planning by each major research and support organization, and ensure that their assessment plans include the proper mix of self-assessment and independent assessment to address appropriately the broad range of relevant ES&H issues.
- Establish and track appropriate indicators of ES&H performance that help promote improvements to the Laboratory's safety culture and research performance.
- Enhance the Laboratory's current environmental management system to support the goals of the *Greening of the Government through Leadership in Environmental Management (*Executive Order 13148) and the associated DOE Notice N 450.4 by, in part, establishing clear environmental policies, interpreting the environmental management system as part of the ISM program, and continuing to work toward good relations with stakeholders and surrounding communities.
- Establish and maintain a long-term stewardship program for environmental monitoring of Laboratory remediation sites.

Strategies

Argonne regularly (1) evaluates its ES&H requirement documents to ensure that they reflect changing regulations, (2) implements the documented requirements, and (3) assesses various ES&H program elements to measure implementation of requirements and to promote continuous improvement.

The Laboratory uses limited available resources to address ES&H concerns that pose the greater risks. However, setting priorities often requires considerable judgment in such areas as promoting continuous improvement in the Laboratory's safety culture, in the performance metrics system, and in other ES&H systems. Argonne relies on the creativity of its personnel to establish ES&H requirements and implementation strategies that are consistent with the risks presented by the work being done. Specific needs are documented as part of the Laboratory's *ES&H and Infrastructure* (*ESH&I) Management Plan* process.

Argonne will continue to pursue its ES&H goals through its strategic objectives by using established systems operating pervasively under the ISM philosophy. The Laboratory will continue to monitor its ES&H performance by using *Prime Contract* performance measures, other germane indicators, and its formal assessment program. The Laboratory will continue to conduct frequent monitoring, surveillance, and evaluation in the workplace in order to implement specific ES&H performance measures and to address ES&H issues generally.

Argonne uses a structured approach to ensure that facility conditions affecting ES&H are

appropriately identified and prioritized among all Laboratory infrastructure needs. The Laboratory's *ESH&I Management Plan* addresses required reporting to DOE by means of a detailed prioritization of all ESH&I projects. Projects related to ES&H include life safety and fire protection upgrades, environmental restoration, wetlands management, mechanical and control systems, an electrical service upgrade line item, decontamination and decommissioning activities, and a facility to store remotely handled transuranic waste for final disposal.

Argonne's assessment program includes (1) assessments conducted by line organization managers to evaluate their own processes; (2) other self-assessments conducted by line organizations to evaluate specific topics; and (3) independent assessments conducted by Laboratory organizations or committees, by committees of the University of Chicago, by DOE, or by other regulatory agencies or stakeholders. On the basis of the results of these assessments and other evaluations, Argonne establishes appropriate corrective action plans. Where corrective actions require significant resources and changes to the Laboratory infrastructure, Argonne uses the formal *ESH&I Management Plan* process to identify and prioritize resource allocation.

To address the requirements in DOE Notice N 450.4, Argonne plans to include existing program elements in an environmental program description that is integrated with the current ISM program description. The environmental program description will explain (1) how the Laboratory's work meets DOE regulatory requirements and environmental regulations such as the Resource Conservation and Recovery Act and the Comprehensive Environmental Response, Compensation, and Recovery Act and (2) ongoing Laboratory programs that promote pollution prevention, waste minimization, long-term stewardship, community relations, and continuous improvement.

C. Site and Facilities

Situation

Argonne conducts basic and technology-directed research at two sites owned by DOE. Argonne-East is located on a 1,500-acre site in DuPage County, Illinois, about 25 miles southwest of Chicago. Argonne-West is located on an 800-acre tract within the Idaho National Engineering and Environmental Laboratory (INEEL), about 35 miles west of Idaho Falls, Idaho. Argonne-West is devoted mainly to R&D on nuclear technologies and nuclear environmental management.

The physical infrastructure at Argonne-East contains 4.8 million square feet of floor space, including 77 thousand square feet of nearby leased space. The facilities, valued at approximately $1.9 billion, currently accommodate about 4,800 persons (including DOE employees, contractors, and guests). Throughout the year, over 2,000 other researchers use the Laboratory's scientific facilities as visitors or collaborators. Argonne-East facilities are nearly 99% occupied.

Argonne-West contains 581,000 square feet of floor space, with an estimated replacement value of $438 million. The site currently accommodates about 690 persons. Recent renovations and continuing maintenance of major facilities are enabling Argonne-West to pursue important research on nuclear technology for DOE. Program sponsors other than DOE-Nuclear Energy are charged for facility utilization in a manner similar to the space use charge-back system at Argonne-East. Site services such as fire protection and dosimetry are purchased from the site contractor for INEEL.

Supplement 3 (located near the end of this document) provides additional information on Argonne's sites and facilities, including plans for infrastructure and for the rehabilitation and modernization of facilities.

Vision

Argonne will retool its physical setting to achieve a 21st-century infrastructure having appropriately configured research facilities that provide reliable, safe, secure, efficient, attractive working environments suitable for world-class science, engineering, and technical services.

Issues and Strategies

In the area of site and facilities, the principal challenges Argonne is addressing are the normal aging of buildings and infrastructure and a substantial need for upgraded laboratory facilities to meet the challenges of the 21st century. As Figure V.2 shows, 41% of Argonne-East facilities are over 40 years old, while at Argonne-West 65% of space is over 30 years old.

Argonne-East

In recent years Argonne-East has made substantial progress toward the rehabilitation and replacement of its facilities. However, as Figure V.3 shows, an estimated 39% of the site's occupied facilities are still in need of major rehabilitation or upgrades. Forty-three percent of the facilities are considered to be in adequate condition, while 4% of laboratory floor space is in substandard facilities that require removal.

Over the infrastructure planning horizon, new programmatic facilities are likely to expand the base of modern, efficient space at Argonne-East. Nevertheless, substantial need for rehabilitation of older facilities will remain.

Strategic modernization of Argonne-East facilities centers on three coordinated, phased upgrade projects addressing (1) building electrical systems, (2) building mechanical and control systems, and (3) laboratory space upgrades. The work scope of each project phase is based on priorities established through the Laboratory's Condition Assessment Survey process.

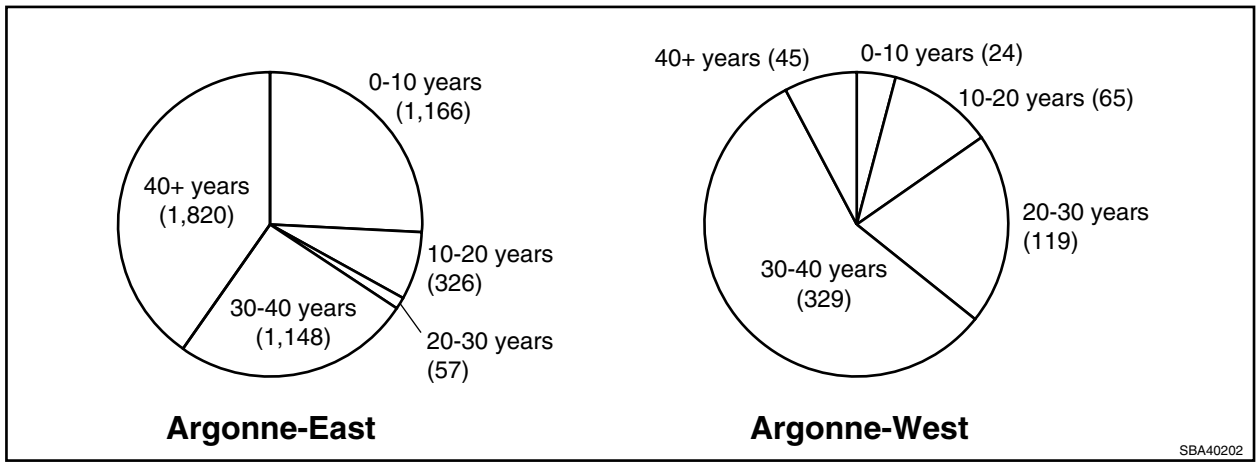

Figure V.2 Age of Argonne Facilities (values in thousands of gross square feet)

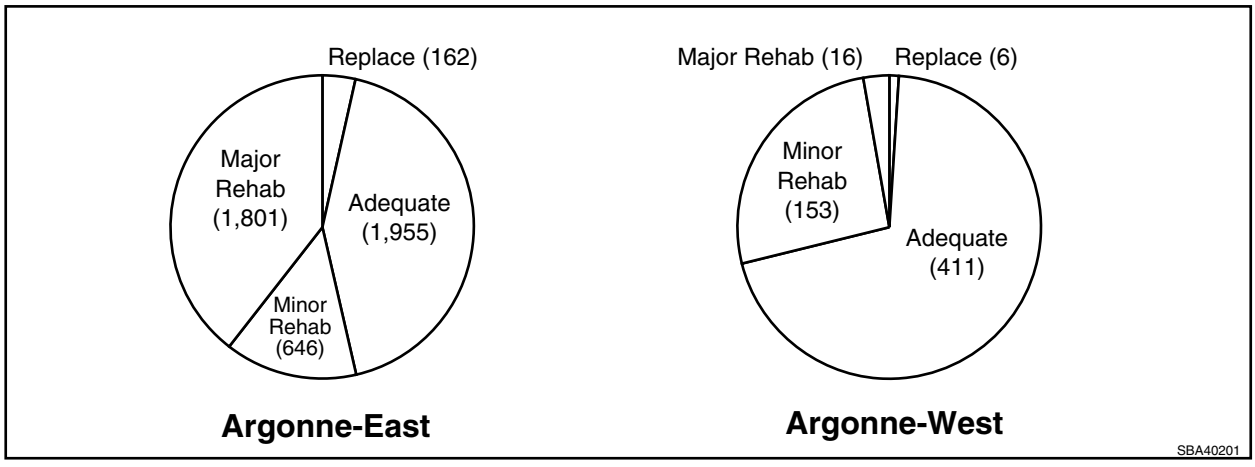

Figure V.3 Condition of Argonne Facilities (values in thousands of gross square feet)

In general, Argonne-East upgrades a building's electrical system to support greater mechanical and functional power and lighting loads and to allow more extensive use of equipment. Improved mechanical and control equipment and upgraded mechanical, distribution, and collection systems are installed as the basis for a building utility support network that is more flexible and adaptable.

In coordination with these efforts, Argonne-East plans significant upgrades to laboratory and office spaces to bring them to today's standards. Modernization is planned for 12 buildings providing 2 million gross square feet of space. The site's new central supply facility exemplifies application of the principles of sustainable design and facilities integration, which will be a hallmark of planned infrastructure upgrades.

Argonne-East also needs new facilities. A general purpose laboratory/office building is needed to relocate research during the modernization of older buildings and wings. Concurrent plans call for a new, centralized computing facility to enable the data sharing and visualization capabilities being included in upgrades throughout the Laboratory and also to provide supporting general purpose equipment. In addition, a new high bay facility is needed for general program work.

Roof replacement is a major Argonne-East initiative as the roofs of major buildings near the end of their 20-year design life and the frequency of repairs increases. Similarly, deteriorating roads and parking lots will require substantial investment over the next 5 years.

Other site improvements also have high priority. The Argonne-East telecommunications system requires immediate attention to achieve the required conversion to digital equipment by January 2005. The proposed Phase V Fire Safety Improvements project will reduce the potential for property loss. In addition, the site's central heating plant will require a major upgrade of its auxiliary systems and equipment by FY 2008.

To achieve a 21st-century infrastructure, Argonne-East requires total capital funds of approximately $294 million in FY 2003 through FY 2008. (See Supplement 3 for details.) Figure V.4 shows the distribution of the total between General Purpose Equipment (GPE), General Plant Projects (GPP), and line-item funding. In addition, the site requires a total of $58 million in direct operational funding from the DOE Office of Science to undertake needed environmental and demolition work not currently supported by funding from the DOE-Environmental Management program.

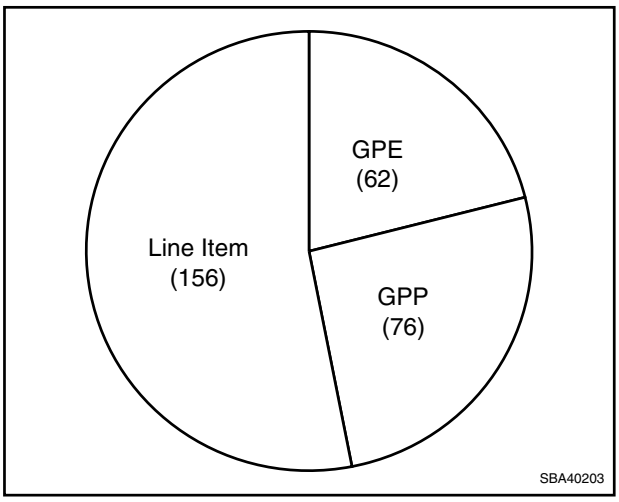

Figure V.4 Six-Year Capital Funding Requirement for Argonne-East ($ million)

Argonne-West

In recent years Argonne-West has made substantial progress toward maintaining the condition of its facilities. However, as Figure V.3 shows, an estimated 9% of the site's occupied space still needs major rehabilitation or upgrades, while 20% needs minor rehabilitation. Seventy percent of occupied space is considered to be in adequate condition. Only 1% of space is substandard and requires removal.

Strategic modernization of Argonne-West facilities basically uses the coordinated, phased approach to upgrades also used at Argonne-East. Priorities established through the Laboratory's Condition Assessment Survey indicate that upgrades are needed for the site's building electrical systems and its mechanical and control systems. In addition, Argonne-West plans significant upgrades to facility and office space to achieve current standards.

Argonne-West also needs new facilities. A general purpose office building is needed to replace eight "temporary" office buildings presently housing administrative, engineering, and DOE personnel.

Roof replacement is a major Argonne-West initiative as the roofs of major buildings near the end of their design life and the frequency of repairs increases. Similarly, deteriorating sidewalks will require substantial investment over the next five years.

To achieve a 21st-century infrastructure, Argonne-West requires total capital funds (GPP and GPE) of approximately $11 million in FY 2003 through FY 2008. In addition, Argonne-West requires direct operational funding of $6 million per year for real property maintenance.

Closure of the Experimental Breeder Reactor-II at Argonne-West is scheduled for completion in 2002. This work will place the facility in a safe, stable condition requiring minimal surveillance and maintenance for an indefinite period prior to eventual decontamination and decommissioning. Nevertheless, the facility is contaminated and should be considered a candidate for transfer to DOE-Environmental Management for cleanup.

The demand for hot cell and laboratory space at Argonne-West is particularly high. A major focus is providing the facilities and infrastructure needed to deal with spent fuel and nuclear waste (for the electrometallurgical fuel treatment program, for example).

Argonne-West is planning construction of a major hot cell facility needed to handle and process for disposal remotely handled mixed transuranic waste from both Argonne-West and INEEL. Disposal of this waste outside Idaho by the year 2018 is required by the court-ordered settlement agreement between DOE and the state of Idaho. Moreover, after 2018 this facility will be a cornerstone — along with the Hot Fuel Examination Facility and the Fuel Conditioning Facility — for a much needed DOE hot cell center that will (1) develop base technologies to address problems associated with disposal of remotely handled waste and (2) support research to improve nuclear fuels and materials.

D. Integrated Safeguards and Security Management

Situation

Argonne has a responsibility to provide a safe and secure environment for all its employees and visitors. Facilities, equipment, and information must be protected from theft, disruption, or misuse. Argonne-West protects significant quantities of special nuclear material. (Argonne-East possesses only small quantities of nuclear materials for limited research use.) Detection and prevention of electronic intrusion are among the more challenging aspects of security facing the Laboratory.

Argonne's mission predominantly involves fundamental research or technology development, with results disseminated openly and shared with the scientific community or made available to private industry. The quality of such work depends intrinsically on open dialogue and exchange of information. To serve its mission, the Laboratory each year hosts thousands of foreign visitors and assignees, with whom it encourages active information exchange. The Laboratory also participates in several officially sanctioned training programs with Russia, other countries of the former Soviet Union, and the International Atomic Energy Agency. As a key player in leading-edge cooperative R&D with U.S. industry, Argonne often conducts research involving vital commercial interests.

Most Argonne work is exempt from export regulation and is constrained only by prudent management to assure accuracy and proper disclosure. Nevertheless, certain Laboratory undertakings are subject to some combination of export control, classification, proprietary interest, and other restrictions on dissemination of results.

Objectives

The Argonne-West Reactor Program Services Division, the Argonne-East Office of Safeguards and Security, the chief information officer, and the Office of Counterintelligence mutually

integrate their efforts to ensure the following results:

- Site access controls provide a safe, secure working environment for employees; for guests; and for the large, diverse community of visiting researchers using Laboratory facilities.
- An active cyber security program makes electronic information freely and readily accessible to authorized users while protecting the information against disruption, compromise, destruction, or misuse.
- Appropriate processes and procedures are in place to assure controlled access to classified and proprietary information.
- Active awareness training and information programs educate all employees in how to maintain and enhance Laboratory security.
- Appropriate controls and systems protect special nuclear materials, classified matter, and high-value property against theft, diversion, or destruction.

Argonne's security organizations work closely with each other and with senior management to ensure that policies and systems are optimized to protect Laboratory assets while enabling scientific progress.

Strategies

Protection of physical assets at Argonne requires a combination of access controls and other security measures. Protecting equipment, hardware, and materials at Argonne-East generally involves practices characteristic of industrial security. The protective forces at the Argonne-East site are trained security professionals who operate under contract to the Laboratory. The Laboratory manages and administers these forces, which include unarmed, trained security officers. The Laboratory is responsible for providing security for the entire Argonne-East site, including DOE offices and the New Brunswick Laboratory.

The larger quantities of special nuclear material at Argonne-West necessitate more extensive access controls and security force capabilities. The site's security force is armed and certified by DOE to the SPO-II level. Some officers are certified to the SPO-III level and are assigned to special response teams. All members of the Argonne-West security force are regular Laboratory employees. The site also employs physical protection systems such as sensors, alarms, physical barriers, entry control devices, and surveillance systems. An extensive, documented vulnerability analysis is under way, utilizing DOE's *Design Basis Threat*.

Protection of intellectual property involves implementing an integrated network of policies, procedures, and practices. Argonne meets all federal regulations relating to national security and export control, including all applicable DOE regulations. Key to the Laboratory's program are access control and awareness training, supplemented by an extensive cyber security program for both classified and unclassified computing and by counterintelligence activities. A graded approach is used to determine the type and intensity of protective measures implemented.

Argonne's cyber security program is designed to prevent, at both Laboratory sites, unauthorized access to information and disruption of information systems, with minimal disturbance of open scientific discourse. The program identifies information having national security interest; information whose distribution should be limited, from the perspective of Laboratory management, operations, and business activities; commercial or proprietary information; and research information that has not yet been approved for release. Access to all information other than general public-use information is protected by graded or tiered access-control mechanisms and is systematically monitored. Encryption is used where appropriate. Reporting and tracking capabilities are employed locally to anticipate cyber security problems before they occur, and a full response capability is maintained. Cyber security systems are evaluated and tested regularly, and improvements are deployed continuously to counteract changing threats. The Laboratory provides computer security training to all of its computer users.

At both sites, Argonne maintains an Operations Security (OPSEC) program designed to minimize the ability of foreign intelligence agencies or other adversaries to exploit sensitive DOE activities or information and to prevent the inadvertent disclosure of such information. The

OPSEC program is supported and overseen by an OPSEC working group, which represents both programmatic and operations organizations. Support by the working group includes (1) development and review of the site's *OPSEC Program Plan, Critical Program Information,* and *Comprehensive Local Threat Statement;* (2) participation of group members in OPSEC assessments; and (3) review of assessment results and countermeasures. The OPSEC working group also provides oversight and advice to senior management on the Laboratory's broader safeguards and security program, as well as advice to program managers.

The Laboratory has a robust classification program at each site to establish policies and procedures that ensure the proper identification and classification of information that requires protection in the interest of national security. The classification officer at each site develops and implements training programs for persons working with classified information. Trained, knowledgeable persons are certified as "authorized derivative classifiers" to support both individual projects and routine Laboratory work. These individuals and classification officers review potentially sensitive information to ensure that all classified information is identified and protected.

The main objective of Argonne's counter-intelligence (CI) program is to support DOE's CI program generally and the Laboratory specifically, by detecting, counteracting, and preventing political, economic, industrial, and military espionage and other clandestine intelligence-gathering activities directed at Argonne personnel, information, activities, facilities, and technologies. The CI program is designed to deter and neutralize intelligence gathering on behalf of foreign governments or others. At both Argonne sites, this multifaceted program encompasses CI awareness, CI aspects of cyber security, CI-related investigations, and threat analysis, as well as liaison with federal, state, and local law enforcement and the U.S. intelligence community.

The CI program at each Argonne site supports and strengthens the Laboratory's overall safeguards and security program by working in concert with programs addressing security education and awareness, foreign visits and assignments, foreign travel, cyber security, operations security, information security, personnel security, nuclear material control and accountability, and physical security.

E. Information Management

Information management at Argonne emphasizes the effective development, communication, and management of scientific, technical, operational, and administrative information. Because of the broad importance of information management and its associated infrastructure, those two intimately related areas are managed both as integral parts of research programs and as institutional functions.

Vision

Argonne will maintain high-performance, cost-effective infrastructure and services in information management. These capabilities will support excellence and efficiency in the Laboratory's R&D program by providing for optimal use of text, data, images, and sound in appropriate media. Employees will be proficient in the computer-related skills needed to realize fully the benefits from the Laboratory's information systems.

1. Information Technology

Situation

Argonne provides a wide range of central services to support the digital collection, creation, dissemination, and archiving of R&D and business information. Service organizations also operate a Laboratory-wide spectrum of systems and services for software development and application, telecommunications, and computing. Strategic planning, funding, and coordinated management for the Laboratory's information infrastructure and systems are addressed collaboratively by policy and planning groups supported by review and implementation teams.

To ensure that the Laboratory's information management infrastructure evolves as required to support programmatic needs, Argonne leads or

collaborates in various national initiatives in information access, networking, and telecommunications, particularly through pilot projects that test the applicability of new information technologies to DOE-funded R&D. The Laboratory maintains national network connections, such as ESnet (the DOE Energy Sciences Network) and MREN (a high-speed test network in the Chicago metropolitan area, recently upgraded from 155 megabits per second to 622 megabits per second). These external networks interface with local Argonne networks and help to position the Laboratory as a major player in national networking initiatives. Sophisticated network intrusion detection capabilities provide for identification and dynamic blocking of intruders and the detection of cyber security anomalies in network traffic. Each day, as many as 300,000 potential intruder alarms are scrutinized, and a terabyte of network traffic data is analyzed for cyber security anomalies.

Goals and Objectives

The primary goal of information technology at Argonne is to maximize the ease and effectiveness with which information is acquired, created, communicated, stored, retrieved, and applied, both within the Laboratory and with the Laboratory's partners in government, academia, and the private sector. The Laboratory's operations organizations have the following supporting objectives:

- Maintain an efficient, standards-based infrastructure for communications, computer networking, and information systems.
- Continually enhance services that facilitate internal and external information exchange.
- Conduct education programs that upgrade the computer literacy and skills of Laboratory employees.
- Maintain a strong cyber security infrastructure and program.
- Maintain strong core competencies in state-of-the-art and emerging information technologies that enable timely deployment of systems and services tailored to mission needs.
- Evaluate emerging information technologies through aggressive use of demonstrations and pilot projects.

Strategies

Argonne's near-term strategies for information technology focus on the Laboratory's needs for (1) secure, high-performance telecommunications and networking infrastructure and (2) high-quality Laboratory-wide information systems and services.

Key strategies for achieving secure, high-performance, cost-effective network facilities include the following:

- Upgrade Laboratory network facilities to provide high-speed network architectures.
- Reengineer remote-access systems to allow secure use of Internet service providers.
- Upgrade Laboratory networks to provide redundancy and enhanced security.
- Ensure Argonne's interoperability with other DOE sites and commercial service providers through the continued use of test beds based on standards adopted at the Laboratory.
- Support DOE's Information Architecture Initiative by actively participating in DOE standards committees and task groups.

Key strategies for achieving high-quality, cost-effective telephone services include the following:

- Take full advantage of competitive market options beyond 2002 to acquire cost-effective voice, data, and video network services that can be reconfigured quickly if any single carrier fails.
- Encourage carriers to provide voice, data, and video services to the Laboratory via dedicated fiber-optic cable.
- Deploy an internal telecommunications architecture based on standards widely supported by the commercial telephone service providers for their high-speed interconnections, to ensure that the Laboratory

benefits from compatibility and maximum flexibility in meeting future needs.

- Upgrade the Laboratory's central telephone switch in 2002-2003; eventually replace this switch by merging its functions with the advanced network switching technologies now available.

Key strategies for maintaining strong core competencies in current and emerging information technologies include the following:

- Work with the National Energy Research Supercomputer Center and several other national laboratories and agencies to develop cross-realm authentications for the ESnet wide-area network and the emerging next-generation Internet.
- Work with ESnet and several other national laboratories and agencies to ensure Argonne's interoperability with other DOE sites and commercial service providers by means of continued use of test beds based on standards adopted at the Laboratory.
- Participate in a DOE pilot project to demonstrate high-performance network environments linked across dedicated commercial interconnections, in preparation for the advanced fast-packet-switching services that will soon be offered generally via ESnet. (These advanced networking initiatives are particularly important as infrastructure for high-performance computing programs at Argonne and for providing convenient access to user facilities such as the Advanced Photon Source.)

The Laboratory operates a suite of central information systems in the areas of records, finance, personnel, procurement, facilities, scientific and technical information, environmental protection, and employee health and safety. Key strategies for achieving high-quality, cost-effective central information systems include the following:

- Develop central information systems by using an information technology capital investment management process implemented by working groups comprising senior management representatives from both programmatic and operations organizations.
- Evaluate the Laboratory's current strategy of purchasing commercially available applications versus a strategy of building applications on a strong web-based infrastructure and architecture.
- Streamline and automate Laboratory business processes to take full advantage of the capabilities of current information system software and developer tools.
- Pursue new initiatives that will improve Laboratory-wide access to data supporting R&D and operations functions.
- Expand the use of electronic data interchange (EDI) to implement electronic commerce more fully in the Laboratory's business activities.
- Simplify user access to operational and administrative information through expanded use of web interfaces.

2. Scientific and Technical Information

Situation

Scientific and technical information (STI) is both an essential driver and the main product of Argonne's R&D. The Laboratory manages its STI via an integrated suite of programmatic and support activities. Infrastructure that supports effective stewardship of STI throughout its life cycle includes virtual and physical library systems, publishing and presentation services, and records management services.

Through digital, print, and staff resources, Argonne's research library provides efficient, structured access to the full range of global scientific and engineering information needed to undertake R&D. The Argonne Information Management (AIM) System is the key mechanism for delivering library resources to researchers. As a web portal to multidisciplinary information resources and services at Argonne and around the world, the AIM System averages over 16,000 user sessions per month. Over the past five years, customer usage of this system has increased 65%, and the average cost per use has dropped 20%.

Dissemination of results from Argonne's R&D is made more effective by centralized

publishing and presentation support services at both major Argonne sites. These services encompass communications planning, writing, editing, the visual arts, and document production, with award-winning products in all conventional and digital media. Final Laboratory publications are posted to a central Internet site to broaden their availability to the global scientific community.

Argonne's central records management services support the preservation of scientific and business information in accord with federal requirements. Services provided include technical assistance to records originators, a records inventory system, storage and disposal of older records, and records searches.

Goals and Objectives

The goal of STI management at Argonne is to enhance the quality, productivity, and recognition of Laboratory R&D by enabling scientists and engineers to acquire and use relevant information rapidly and to communicate their findings effectively. Supporting objectives are (1) to provide high-performance digital systems and human services that give rapid, easy, continually improving access to STI and (2) to operate STI systems and services cost-effectively.

Strategies

Key strategies for providing high-performance STI systems and services include the following:

- Influence the direction of electronic publishing to the benefit of Argonne and other national laboratories through collaboration with private-sector publishers, other research institutions, and federal agencies, taking advantage of national and international forums, such as the Library Advisory Council of the Institute of Electrical and Electronics Engineers, Inc.
- Integrate industry-leading, standards-based, commercial hardware and software systems, as well as forefront creative practices, into Argonne's communications, library, and records management functions.
- Apply insights from internal customer feedback and external peer reviews to enhance the quality of Argonne's STI infrastructure and services. One example of external review is entry of publication and presentation products into professional peer competitions, which annually bring substantial numbers of awards to the Laboratory.
- Enhance the STI resources available on the desktops of Argonne researchers through the AIM System. The system's growing virtual library includes electronic journals, scientific databases, reports, standards, specialized search and retrieval tools, and inventories of Argonne-authored publications and Argonne records. In 2002, 61% of the 1,118 journal titles purchased by the research library are available to Argonne staff electronically.
- Increase the global public availability of Argonne-authored technical reports and conference papers via both a Laboratory Internet site and DOE-operated information dissemination systems.

Key strategies for achieving cost-effective systems and services include the following:

- Leverage capabilities developed to acquire, use, and communicate STI to improve management of text-based business information. Current examples are the management of office copier rental programs by central document production groups at both major Argonne sites; the integrated management of scientific and business records; and the inclusion of Laboratory manuals, business correspondence, and forms in the research library's AIM System.
- Operate support organizations at both major Argonne sites to provide the STI systems and services that are most efficient when their management is centralized.
- Match the scope and timeliness of institutional STI services to the needs of Argonne's R&D programs, through collaborative planning and budgeting by programmatic and operations staff and management.
- Purchase library collection materials through cost-saving consortial agreements, such as those negotiated by the DOE laboratories' library consortium; link Argonne staff to external library collections of special value,

notably those of the University of Chicago and other major research libraries in Illinois.

- Apply industry best practices for efficiency in all STI activities.

F. Communications, Outreach, and Community Relations

Situation

To conduct its R&D operations efficiently and effectively, Argonne must have the confidence and support of its stakeholders. The Laboratory's major non-DOE stakeholders include Argonne employees, the research community, local and national news media, the trade press, the broad national public, members of the public living near the two Argonne sites, the educational community, and potential licensees and research partners in industry. Accordingly, the Laboratory takes special care to maintain close, positive relationships with all of these groups and to foster a climate of mutual trust. This effort involves constant attention to two-way communications that are accurate, clear, timely, and credible. An active and growing outreach program seeks to inform Argonne's constituents about the Laboratory's work and to involve them constructively in its activities.

The major elements of Argonne's programs in communications, outreach, and community relations involve the following activities:

- *Employee Communications.* Argonne's weekly employee newsletter, according to a recent survey, is read in its entirety or in part by more than 99% of employees. Employee communications are also well served by site-wide electronic mail broadcasts, a continually updated intranet, a telephone INFO-line, on-site technical and scientific seminars and conferences, colloquia featuring renowned speakers, and a variety of special employee events. An annual highlight is the "State of the Laboratory" address by Argonne's director.

- *The Research Community.* Ongoing communications with peers in the research community are conducted by staff who publish more than 2,000 research papers and reports annually and who participate in scientific and technical conferences — often presenting papers or sponsoring events.

- *Media Relations.* Argonne's external communications efforts mainly target the news media, which constitute the Laboratory's major avenue for informing the national and local public about both the long-term value of scientific research in general and the benefits of Argonne and DOE-funded research in particular.

- *Trade Press.* The trade press is an important vehicle for informing industrial researchers and executives about Argonne's research and facilities, which can help industry solve its research problems and can lead to other productive relationships, such as R&D partnerships.

- *Community Relations.* Argonne's wide-ranging community relations programs reach all of the Laboratory's major stakeholder groups. These programs include site tours, open houses and other special events, speeches by staff to external audiences, and a vast array of Laboratory-sponsored conferences and seminars.

Communications and outreach are also important aspects of other major Laboratory activities discussed elsewhere in this *Institutional Plan*, notably science education (see Section IV.A.1.j) and technology transfer (see Section IV.A.4 and Supplement 2).

Goals and Strategies

Argonne continually seeks opportunities to further strengthen the Laboratory's programs in communications, outreach, and community relations. Pursuit of the following important opportunities is under way or being planned:

- The Laboratory is increasing its traditional outreach to the general science news media through efforts such as increased representation at press briefings and annual meetings of professional research societies.

- The science content of Argonne's quarterly magazine *logos* is being increased, and the publication is being repositioned to target a

primary audience of researchers and "the interested layperson."

• The effectiveness of the Laboratory's Speakers Bureau is being strengthened and rejuvenated through an aggressive outreach program to make potential audiences more aware of Argonne speakers and the relevance of their topics and expertise to the interests of stakeholder groups.

• The Argonne Information Center is being enhanced through the efforts of a new committee that is developing outreach programs aimed at community and educational groups.

• Argonne will continue to work closely with DOE-Chicago Operations and its Argonne Area Office to nurture a series of quarterly meetings with leaders from communities neighboring Argonne-East. This highly successful Community Leaders Roundtable keeps Argonne's neighbors informed about the Laboratory's activities and expected impacts to the surrounding area, and it provides an informal forum for feedback.

For more than a half century, Argonne has benefited from remarkably strong community support, positive news media relations, and strong management commitment to communications and outreach. The strategies outlined above are designed to build on those successes.

G. Performance Management

Situation

The performance-based *Prime Contract* under which the University of Chicago operates Argonne for DOE specifies objectives, performance measures, and incentives that foster outstanding performance by the Laboratory. Since FY 1996, the Laboratory's performance has been evaluated on the basis of previously negotiated measures and expectations, as specified in Appendix B of the *Prime Contract*. (The term of the current contract extends through September 2004.)

Argonne's performance ratings have consistently been in the range of excellent to outstanding. In FY 2001 Argonne achieved a rating of outstanding in all three major performance categories: Science and Technology, Critical Operations, and General Operations. (See Figure V.5.)

Goals

Performance management begins with identification — by top Argonne management, the University of Chicago, and DOE — of high-level performance goals in three broad areas:

• Science and Technology — Argonne will deliver innovative, forefront science and technology aligned with DOE strategic goals and will conceive, design, construct, and operate world-class user facilities, all in a safe, environmentally sound, efficient manner.

• Contractor Management — The University of Chicago will provide leadership, guidance, and oversight that add value to the overall management of Argonne.

• Operations — Argonne will conduct all work and operate facilities cost-effectively and with distinction to achieve integration with and support of its missions in science, technology, energy, and environment, plus full protection of its workers, users of its facilities, the public, and the environment.

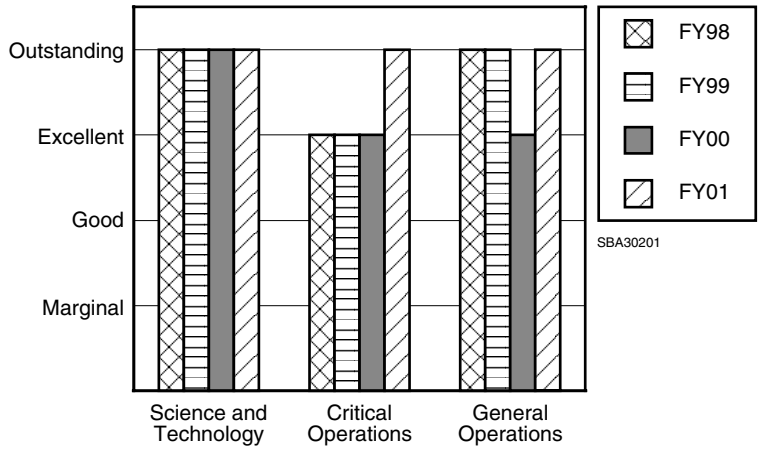

Figure V.5 Argonne Performance Ratings

Strategies

Performance measures are developed for Argonne with the following criteria in mind:

- Contributes directly to or enhances the Laboratory's ability to accomplish its R&D mission.
- Drives performance by concentrating on desired outcomes.
- Compels the Laboratory to focus on systems performance, cost-effectiveness, and continuous improvement of functions and services essential to its mission.
- Allows for meaningful analysis of trends and rates of change.
- Adds commensurate value in the context of the Laboratory's mission and its entire performance plan.

The Critical Operations performance category considers functions that have a direct and significant impact on the Laboratory's ability to carry out its missions. Performance in this area and in Science and Technology determines the annual fee received by the University of Chicago from DOE. In FY 2001 the operational functions in the Critical Operations category were leadership, ISM, project and infrastructure management, and cyber security. Table V.3 gives examples of performance measures in those four functional areas. Figure V.6 indicates the weightings given the four areas.

Table V.3 Critical Operations — Examples of Performance Measures

Functional Area	Measure
Integrated Safety Management	Laboratory air and water effluents compared to U.S. Environmental Protection Agency compliance standards
Project and Infrastructure Management	Actual costs and milestones compared to predetermined schedules
Leadership	Effective succession planning demonstrated for key personnel
Cyber Security	Identified system vulnerabilities addressed on schedule

A number of operational activities not identified as critical are nevertheless included in Argonne's performance management process. Performance in these general operations activities (see Table V.4) does not directly affect the University's performance fee, but it does affect the size of the Laboratory's annual employee bonus pool.

Table V.4 General Operations Functions

Communications and trust	Procurement
Counterintelligence	Property management
Finance	Publishing
Human resources and diversity	Safeguards and security
Information management	Technology transfer
Legal management	Work for others

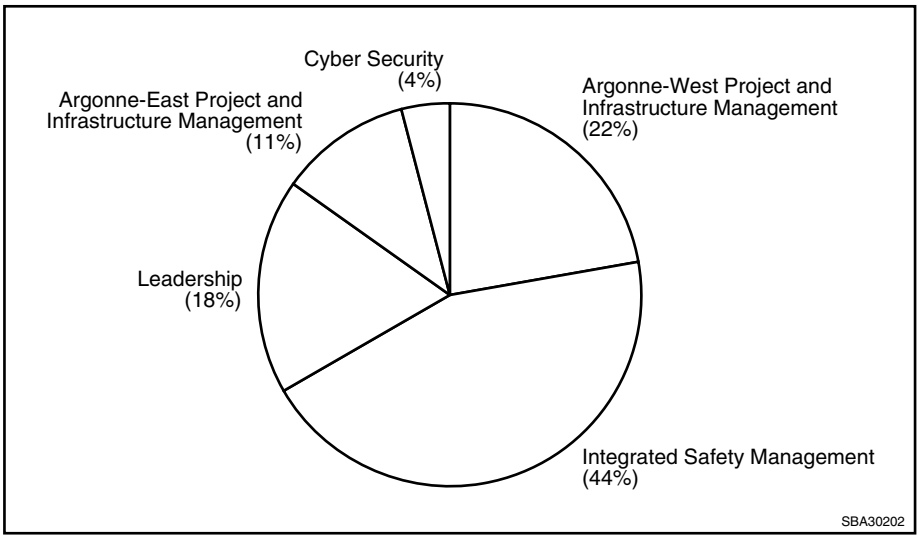

Figure V.6 Critical Functions by Contribution to the FY 2001 Operations Performance Rating

Working together, DOE, the University of Chicago, and Argonne have built strong momentum in continuously enhancing performance through ongoing feedback and improvement across the Laboratory. Ongoing improvement includes refinement of the measures used to drive performance, in order to better reflect desired outcomes and value added to the Laboratory's research programs. As a general

strategy, the university and the Laboratory are seeking to increase the use of peer review in the oversight and management of Laboratory operations.

H. Cost-Effectiveness of Support Functions

As a broad goal, Argonne seeks to achieve productivity improvements sufficient to accommodate a moderate decline in the total constant-dollar resources received by the Laboratory. More specifically, Argonne seeks increased efficiency and effectiveness in its overhead and technical support services sufficient to maintain a stable scientific workforce.

Situation

Argonne's overhead management process has contributed significantly to reducing the Laboratory's overhead rate over the past several years, a time when DOE initiatives exerted great cost pressure. As indicated in Figure V.7, the Laboratory was able to reduce its overhead cost percentage performance metric from 22.4% in FY 1994 to 19.5% in FY 2001. Argonne has maintained an efficient balance of researchers and support personnel, while it has improved the cost-effectiveness of its support functions. Figures V.8-V.10 show further performance metrics indicating

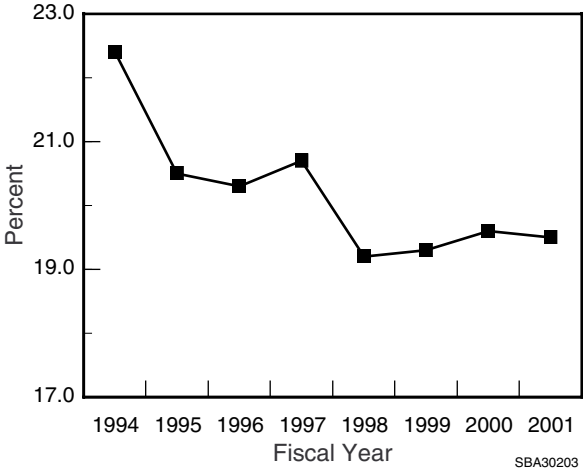

Figure V.7 Overhead Management Performance (overhead cost as a percent of total operating cost)

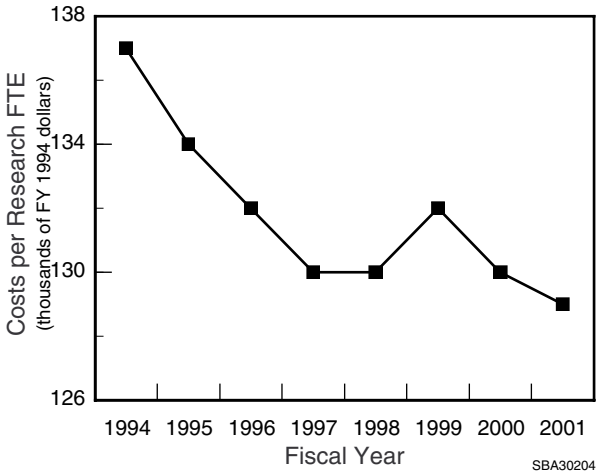

Figure V.8 Operating Costs per Research FTE

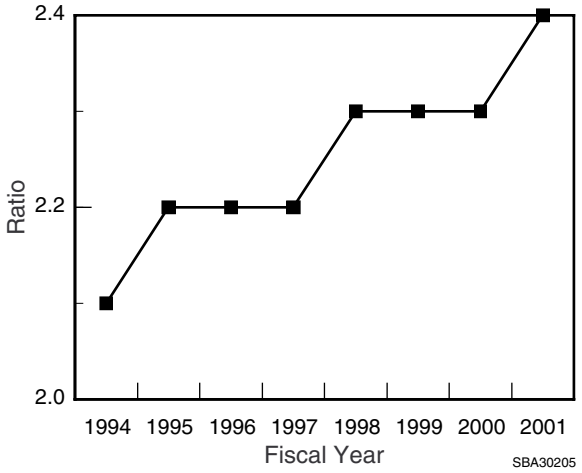

Figure V.9 Research to Support Ratio (research labor costs divided by support labor costs)

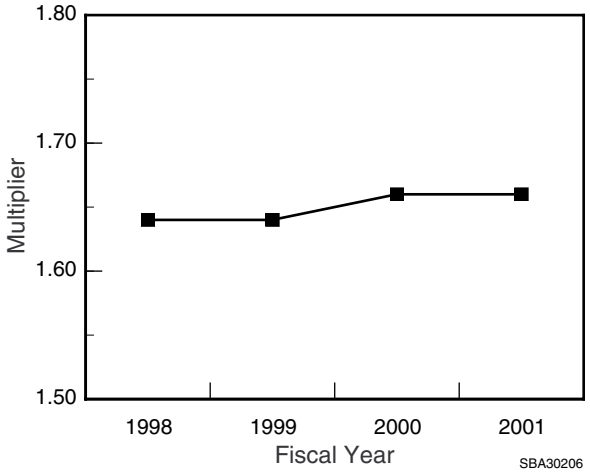

Figure V.10 Composite Support Cost Multiplier on a Direct Research Dollar

the Laboratory's successful commitment to improving efficiency.

Challenges and Strategies

Argonne must continuously improve the productivity of its scientific and support activities and keep its overall cost of operation among the lowest for a DOE multiprogram laboratory. To this end, the Laboratory performs diligent, focused reviews of all its support costs, with particular attention to opportunities for additional process improvements. Reviews of support costs (1) use thorough, activity-based costing plans and tracking mechanisms to identify high-cost activities; (2) focus on documentation of baseline data and benchmarking of processes; and (3) generally create an atmosphere conducive to results-oriented management. Careful attention is given to identifying more effective cost-distribution methodologies. Argonne seeks out and adopts best practices in other organizations, including private firms and other laboratories. At the same time, best practices within the Laboratory are identified for broader application.